

*Case Report***Peripheral Intravenous Catheter Fracture**Yashas H R<sup>1</sup>, Srinath R<sup>2</sup>, Geetha Avadani<sup>3</sup>, Rahul<sup>4</sup><sup>1</sup>Assistant Professor, <sup>2</sup>Professor, <sup>3</sup>Professor & HOD, <sup>4</sup>Post Graduate,  
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*Received: 03/08/2015**Revised: 27/08/2015**Accepted: 01/08/2015***ABSTRACT**

**Introduction:** Placing of Peripheral intravenous catheters in patients for the purposes of infusion is common around the world. Catheter clotting and other complications cost the healthcare system over one billion dollar each year.

**Case Report:** A 17 year female patient was admitted for carbolic acid poisoning & during the treatment period, when 20 F cannula inserted in the median cubital vein, was removed by the nurse, Pt c/o swelling & cord like feeling which was painful. Physical examination revealed a distinct cord-like object palpable under the skin at the insertion point. She was immediately brought to emergency department, where ultrasonography identified a foreign body within the median cubital vein. The object was removed by venous cut down under local anesthesia and was identified as the missing catheter fragment. The patient had an uneventful recovery and was discharged from the hospital the next day.

**Discussion:** Catheter fracture is a known complication of intravascular placement of plastic catheters. The majority of these reports relate to the use of central line catheters, with catheter fragments ranging from 3.5 to 72 cm in length and resulting in a range of complications including sepsis, perforation, thrombosis, dysrhythmia, and myocardial infarction.

**Key words:** Peripheral IV Cannula, central venous catheter, thrombophlebitis.

**INTRODUCTION**

Placing of Peripheral intravenous catheters in patients for the purposes of infusion is common around the world. Catheter clotting and other complications cost the healthcare system over one billion dollar each year.

Common complications associated with central venous catheter are infection, thrombus formation and catheter block. Air embolism, catheter migration, arteriovenous fistula, pseudoaneurysm, hemothorax and pneumothorax are other uncommon

complications. <sup>[1,2]</sup> Peripheral intravenous catheters usually cause phlebitis whereas blockage, infection and extravasation of fluid are other common complications. Although no such data is available from India but complications like migration of central venous catheters have been reported.

We report a case report of peripheral intravenous catheter fracture, one in right cubital fossa & other on dorsum of right hand in 17 year female patient.

## CASE REPORT

A 17 year female patient was admitted for carbolic acid poisoning & during the treatment period, when 20 F cannula inserted in the median cubital vein, was removed by the nurse, Pt c/o swelling & cord like feeling which was painful. Physical examination revealed a distinct cord-like object palpable under the skin at the insertion point. She was immediately brought to emergency department, where ultrasonography identified a foreign body within the median cubital vein. The object was removed by venous cut down under local anesthesia and was identified as the missing catheter fragment. The patient had an uneventful recovery and was discharged from the hospital the next day.

The same patient came to hospital after 2 weeks for follow up & she came with complaints of swelling in dorsum of right hand & cord-like object palpable under the skin.

Ultrasound showed a foreign body in dorsum of right hand & CT scan shown broken catheter which was migrated deep in to the tissues.

Under regional anesthesia which was explored & broken catheter was removed, which was migrated to deeper tissues. She had an uneventful recovery and was discharged after 3 days.

Following the incident, an after-action investigation was conducted. The findings suggested that the probable cause of the catheter fracture was partial transection from either trying to reinsert the needle into the already advanced catheter or advancing both catheter and needle with the needle partially withdrawn.

This may have been further complicated by the anatomic curve in the vein at the antecubital fossa. In either case, attempts to remove the catheter likely

completed the transaction, leaving the intravascular distal fragment

Actions were taken following the incident & revising the safety guidelines for peripheral IV insertion.

Emphasis was placed on avoiding reinsertion of a needle into a catheter that was advanced even partially off the needle.



Figure 1 showing longitudinal section of fractured and displaced IV catheter-CT finding



Figure 2 showing transverse section of fractured and displaced IV catheter-CT finding.



Figure 3 showing removal of displaced peripheral IV catheter.

## DISCUSSION

Catheter fracture is a known complication of intravascular placement of plastic catheters; the first report we identified was by Turner et al in 1954, and numerous others have followed.

The majority of these reports relate to the use of central line catheters, with catheter fragments ranging from 3.5 to 72 cm in length and resulting in a range of complications including sepsis, perforation, thrombosis, dysrhythmia, and myocardial infarction.

Surprisingly, although the use of over-the-needle type peripheral IV catheters dates back to 1957, with wide-spread use beginning in the 1970s, to our knowledge embolism of fragments from fractured peripheral IVs has been reported in the English literature only by Singh et al.

A preponderance of literature advocates immediate removal of catheter fragments.

In a retrospective review of 73 cases in which catheter emboli were left intact, Fisher and Ferreyro reported a 71% incidence of complications including transient arrhythmias, sepsis, and thrombus on the catheter, pulmonary emboli,

arrhythmias and myocardial inflammation.<sup>[3]</sup>

They also documented death caused by retained catheter emboli in 16 cases. Bernhardt et al reviewed 28 cases of retained catheter fragments in pulmonary artery and found a mortality rate of 60% from sepsis, perforation, thrombosis, arrhythmias or myocardial infarction.<sup>[4]</sup>

Richardson et al followed 76 cases of retained catheter emboli and found a complication rate of 45% and mortality rate of 23.7% from similar causes.<sup>[5]</sup>

Despite these reviews, there are still dilemmas regarding the conservative management of catheter emboli, particularly asymptomatic emboli.

Graham et al reported experience with intracardiac catheter embolism in six patients. They concluded that removal of catheter fragments was necessary unless the fragments had been asymptomatic and in situ for 2 years.<sup>[6]</sup>

Szekely et al followed three cases of chronically ill uremic patients with broken subclavian catheter pieces that had migrated to segmental pulmonary arteries without complications 6, 14 and 33 months after fragment dissection.<sup>[7]</sup>

Richardson et al advocated individualization of treatment in poor risk patients with catheter emboli in low risk anatomic locations. However the decision to extract such foreign bodies should be individualized based on their location and risk of possible complications. High risk anatomic regions for catheter emboli include the intracardiac area, specifically the area of right heart. Mortality is lower if the embolus is located in the vena cava and the lowest if the embolus is located in the pulmonary artery.

However if conservative management is opted, a sequential radiographic follow up is essential even in asymptomatic patients otherwise potentially life threatening complications may be provoked in future.

## CONCLUSION

Care should be taken while inserting and removing the peripheral IV catheter, the findings suggested that the probable cause of the catheter fracture was partial transection from either trying to reinsert the needle into the already advanced catheter or advancing both catheter and needle with the needle partially withdrawn, so partially transected catheter should be discarded. And good

quality peripheral IV catheters are preferable to avoid untoward incidences.

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